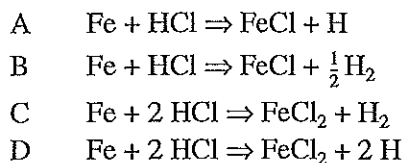


# Topic 1 Equations

1. Which one of the following equations best represents the reaction between iron and hydrochloric acid?

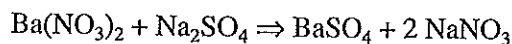


2. What numerical value of Q is required to balance the equation below?



- A 2  
B 3  
C 4  
D 6

3. The equation for the reaction of sodium sulfate with barium nitrate to form a precipitate of barium sulfate is



Which one of the following is the correct ionic equation for this reaction?

- A  $\text{Ba}^{2+} + \text{SO}_4^{2-} \Rightarrow \text{BaSO}_4$   
B  $\text{Na}^+ + \text{NO}_3^- \Rightarrow \text{NaNO}_3$   
C  $\text{Ba}^{2+} + \text{Na}_2\text{SO}_4 \Rightarrow \text{BaSO}_4 + 2 \text{Na}^+$   
D  $\text{Ba}(\text{NO}_3)_2 + \text{SO}_4^{2-} \Rightarrow \text{BaSO}_4 + 2 \text{NO}_3^-$

4. Write in numbers, in front of the formulae, to balance the following equations.

- a)  $\text{CaO} + \text{HNO}_3 \Rightarrow \text{Ca}(\text{NO}_3)_2 + \text{H}_2\text{O}$   
b)  $\text{NH}_3 + \text{H}_2\text{SO}_4 \Rightarrow (\text{NH}_4)_2\text{SO}_4$   
c)  $\text{HCl} + \text{ZnCO}_3 \Rightarrow \text{ZnCl}_2 + \text{H}_2\text{O} + \text{CO}_2$   
d)  $\text{SO}_2 + \text{Mg} \Rightarrow \text{S} + \text{MgO}$   
e)  $\text{Fe}_3\text{O}_4 + \text{H}_2 \Rightarrow \text{Fe} + \text{H}_2\text{O}$   
f)  $\text{K} + \text{C}_2\text{H}_5\text{OH} \Rightarrow \text{KC}_2\text{H}_5\text{O} + \text{H}_2$   
g)  $\text{Fe}(\text{OH})_3 \Rightarrow \text{Fe}_2\text{O}_3 + \text{H}_2\text{O}$   
h)  $\text{CH}_3\text{CO}_2\text{H} + \text{O}_2 \Rightarrow \text{CO}_2 + \text{H}_2\text{O}$   
i)  $\text{Pb}(\text{NO}_3)_2 \Rightarrow \text{PbO} + \text{NO}_2 + \text{O}_2$   
j)  $\text{NaMnO}_4 + \text{HCl} \Rightarrow \text{NaCl} + \text{MnCl}_2 + \text{Cl}_2 + \text{H}_2\text{O}$

5. Write balanced equations for the following reactions.

- a) Copper carbonate forming copper oxide and carbon dioxide.  
b) Nickel oxide reacting with sulfuric acid to form nickel sulfate and water.  
c) Iron and bromine reacting to give iron(III) bromide.  
d) Lead(IV) oxide and carbon monoxide forming lead metal and carbon dioxide.  
e) Iron(II) chloride reacting with chlorine to form iron(III) chloride.  
f) Ethanol burning in air to form carbon dioxide and water.  
g) Silver reacting with nitric acid to form silver nitrate, nitrogen dioxide and water.  
h) Manganese(IV) oxide reacting with hydrochloric acid to form manganese(II) chloride, chlorine and water.  
i) Sulfur dioxide reacting with hydrogen sulfide to form sulfur and water.  
j) Ammonia reacting with oxygen to form nitrogen monoxide and water.